CANADA

DEPARTMENT OF MINES AND TECHNICAL SURVEYS

GEOLOGICAL SURVEY OF CANADA

PAPER 54-14

HEMING LAKE AND ELBOW LAKE, MANITOBA

(Maps and Preliminary Account)

By

J. C. McGlynn

This document was produced by scanning the original publication.

Ce document est le produit d'une numérisation par balayage de la publication originale.

OTTAWA
1955

Price, 50 cents

CANADA
DEPARTMENT OF MINES AND TECHNICAL SURVEYS

GEOLOGICAL SURVEY OF CANADA
Paper 54-14

HEMING LAKE AND ELBOW LAKE
MANITOBA
(Preliminary Account)

By
J. C. McGlynn

OTTAWA
1954

Price, 50 cents

CONTENTS

Introduction 1
General geology 1
Structure 4
    Folds 4
    Faults 5
Mineral deposits 6
    General statement 6
    Description of deposits 7
        The Century mine 7
        Vanderberg group 8
        Elbow Lake property 8
        Ding How property 9
        Webb property 9
        Parres property 10
        Kay Lake property 10
        Vamp Lake property 11
        Redwin property 11
        Fay Lake property 12
        Other deposits 12
References 13

Illustrations

Preliminary map - Elbow Lake Map-area, Manitoba - In pocket
Preliminary map - Heming Lake Map-area, Manitoba - In pocket

HEMING LAKE AND ELBOW LAKE MAP-AREAS, MANITOBA

INTRODUCTION

Heming Lake map-area lies between Cranberry Portage and Sherridon along the Canadian National Railway connecting the two towns. The centre of the area is 15 miles south of Sherridon.

Elbow Lake map-area adjoins Heming Lake map-area on the east and is southeast of Sherridon and northeast of Cranberry Portage. The area is reached from Cranberry Portage by canoe by way of Cranberry Lakes and Grass River. The centre of Elbow Lake area is 25 miles southeast of Sherridon.

Assistance given by residents of the area is acknowledged. Particular thanks are given to S. Bridgeman and S. Dubray.

Able assistance was given by the following student assistants: G. Fogg and G. Genik in 1949; D. Christensen, A. Ireland, and J. Gibson in 1950; W. Nichols, A. Arnasson and P. Karrow in 1951; D. Wehrenberg, J. Thunaes, and A. Chadillon in 1952.

GENERAL GEOLOGY

The oldest part of the Amisk group (1)[1] contains pillow lavas near Elbow Lake, and here and there bands of basic pyroclastic rocks and a little acidic volcanic material. The last is most common northwest of Elbow Lake. The basic lavas are dark greyish green, fine grained, and commonly slightly schistose; they consist of roughly oriented green hornblende, plagioclase, and minor quartz. Near Elbow Lake the volcanic assemblage is highly sheared and chlorite-carbonate or chlorite-epidote schists are widespread. North of North Star and Elbow Lakes and around Fay and Syme Lakes the volcanic rocks are foliated with bands of hornblende alternating with bands of plagioclase (1b). Locally, these hornblende gneisses contain garnet, and south of Loonhead Lake bands of garnetiferous hornblende-plagioclase gneiss (1a). In the vicinity of Paton and Peterson Lakes (Heming Lake map-area) and of Webb Lake (Elbow Lake map-area), the basic volcanic rocks are converted to coarse-grained amphibolites (1c) containing large porphyroblasts of poikilitic hornblende in a groundmass of hornblende and plagioclase. Included with the volcanic rocks are numerous small intrusions of meta-diorite or gabbro.

A band of metasediments (2) occurs west of North Star Lake. These strata overlie the volcanic rocks (1) conformably, and consist mainly of biotite schist and gneiss, commonly garnetiferous, and garnetiferous staurolite gneiss. These metasediments probably represent clastic sediments with interbands

[1] Numbers in parentheses are those of map-units on the accompanying maps.

of shaly material. The metasediments are overlain conformably by hornblende gneisses (3) lithologically similar to the lavas (1).

Other metasediments (4) occur west of Sewell Lake and north of Webb Lake. Those west of Sewell Lake are interbedded greywacke and argillite, whereas those north of Webb Lake are highly metamorphosed hornblende-biotite gneisses. All are younger than Amisk rocks (1-3) but their age relation to the Kisseynew complex is unknown.

The Kisseynew complex (5-7) occurs in the northern parts of both map-areas and consists of biotite gneiss (5), hornblende-plagioclase gneiss (6), and granodiorite and related granitized gneisses of various compositions and textures (7). The biotite gneiss is a fine-grained, light grey to brownish grey, thin-banded rock containing quartz, plagioclase, and biotite. The gneiss is locally garnetiferous. The hornblende-plagioclase gneiss is a fine-grained, dark grey, well-banded rock consisting of alternating bands of hornblende and plagioclase with minor quartz. In both rock types banding is contorted in shear zones. The granodiorite is a pink, fine-grained, faintly gneissic rocks with plagioclase, microcline, quartz, and minor biotite. The granitized gneisses vary in composition and texture and grade imperceptibly into both granodiorite and biotite gneiss or hornblende-plagioclase gneiss. Kisseynew rocks are in fault contact with Amisk rocks (1-3) around Loonhead Lake. North of Fay and Saddle Lakes, however, Kisseynew type biotite gneisses (5) overlie Amisk rocks (1) without recognized intervening structural break, erosional unconformity, or angular discordance.

Rhyolite and quartz-feldspar porphyry dykes and stocks(8) are common in Amisk rocks (1-3) throughout the area. Most dykes of these rocks are small but north of Elbow Lake, around Sewell Lake, and north of Fay and Saddle Lakes some bodies of porphyry are larger than the average size for these intrusions. Dykes of quartz-feldspar porphyry are especially common in the vicinity of Elbow Lake and northwest of Sewell Lake. These rocks although grouped together in the legends are of different ages. Near Sewell Lake the quartz-feldspar porphyry is cut by a meta-gabbro (9) and, therefore, is older than the 'quartz-eye' granite (10). Probably all the porphyry dykes around Sewell Lake are of the same age. Near Webb Lake porphyry dykes cut hornblende-biotite-quartz diorite (11) and, therefore, are younger than the granodiorite. In the field no attempt was made to map the porphyries on the basis of age because they all are similar in composition and appearance. The porphyries are light grey weathering rocks with medium grey fresh surfaces and consist of quartz and feldspar phenocrysts up to 1/4 inch in diameter in a fine-grained matrix of quartz, feldspar, and minor biotite.

Basic intrusions (9), commonly meta-gabbro, occur in the Elbow Lake area as sill-like bodies. A body of meta-pyroxenite lies south and west of Loonhead Lake. These rocks intrude Amisk rocks (1-3) but are older than 'quartz-eye' granite (10), for this granite alters the gabbro where the two are in contact. The relations with quartz-feldspar porphyry (8) are described above. The meta-gabbro and meta-diorite are dark grey, medium grained, massive to slightly schistose and consist of plagioclase and hornblende with minor amounts of apatite, magnetite, and ilmenite. The meta-pyroxenite consists of tremolite with small amounts of feldspar, pyroxene, and magnetite.

'Quartz-eye' granite (10) is the oldest granite recognized in the area and is cut by hornblende-biotite granodiorite and biotite granodiorite (11). The 'quartz-eye' granite alters the gabbro (9) and quartz-feldspar porphyry (8) near Sewell Lake and is, therefore, younger than these rocks. The granite is a grey weathering gneissic rock consisting of plagioclase, quartz, and biotite, with minor amounts of epidote and chlorite. The rock is characterized in the field by blue 'quartz-eye' and greenish grey laths of plagioclase.

Hornblende diorite, hornblende-biotite quartz diorite, and biotite granodiorite (11) form the largest masses of granite in the area. These intrusions cut the 'quartz-eye' granite, and the three rocks, although grouped together on the map, are of slightly different age. Sharp chilled contacts and dyke relations establish the diorite as the oldest of the three and granodiorite as the youngest.

The hornblende diorite is a gneissic, grey weathering, fine- to medium-grained rock consisting of green hornblende, plagioclase, and less than 1 per cent of biotite, quartz, and epidote. The hornblende-biotite quartz diorite is gneissic and is grey on the weathered surface, with lavender-coloured quartz as characteristic. The quartz diorite consists of a fine-grained aggregate of biotite and green hornblende (10 per cent), pink to reddish plagioclase, quartz, and minor amounts of chlorite and epidote. The biotite granodiorite is a gneissic, fine- to medium-grained, pink weathering rock. The plagioclase is flesh coloured. The granodiorite is made up of plagioclase, pink microcline, quartz, and biotite, with epidote and magnetite as minor constituents.

Granitized rocks and migmatite zones occur locally along the contacts of quartz diorite and granodiorite (11). The largest areas of these rocks are west of North Star Lake, west of Loonhead Lake, and north and northeast of Webb Lake. The rocks are very gneissic, grey weathering, and fine to medium grained. Their composition is variable but quartz and plagioclase are always present, also some biotite, hornblende, and microcline. Such types grade imperceptibly into either quartz diorite or biotite granodiorite. Near the contact with sediments the granitized rocks are very gneissic and rich in biotite; near the contact with basic lavas they are gneissic, rich in hornblende, and contain many inclusions of volcanic rocks. Locally the porphyroblasts of plagioclase or microcline occur in granitized rocks.

In the southern part of Heming Lake map-area these intrusions are cut by gneissic hornblende syenodiorite and diorite (12). The rock is grey weathering, fine to medium grained, and is characterized by prominent laths of basic plagioclase. Some phases are porphyrite with plagioclase laths forming the phenocrysts. The plagioclase laths are alined giving the rock its gneissic structure. In thin sections the rock consists of blue-green hornblende, basic plagioclase, and in the syenodiorite microcline. Pyroxene occurs as cores in some hornblende grains. Epidote, iron oxides, and rarely biotite occur as accessory minerals.

The syenodiorite and diorite are cut by a pink weathering biotite granodiorite (13), the largest bodies of which occur in Heming Lake map-area. Dykes of granodiorite are numerous

adjacent to the large bodies of granodiorite. The rock is slightly gneissic to massive, pink, and commonly fine grained. It consists of plagioclase, microcline, and quartz, with about 2 per cent biotite and locally some muscovite. Epidote, chlorite, and iron oxides are accessory minerals.

Although the intrusions (11-13) differ from one another lithologically and are separated by sharp boundaries, all are believed to have been emplaced during one period of orogeny.

STRUCTURE

FOLDS

Amisk and Kisseynew strata are intensely folded. The general trend of the folds in the central and southern parts of the map-areas is north or slightly east of north. In the northern section of the map-areas the folds trend northeast to east. The folds in the east part of Elbow Lake map-area plunge north; the plunge of folds in the vicinity of Elbow Lake cannot be determined definitely. These east-trending folds plunge east to northeast.

Lack of primary structures in the lavas (1) around Elbow Lake makes it difficult to decipher the structure but scattered top determinations on pillows suggest that the basin of the lake may be a syncline. This structure is complicated by smaller folds and faults.

West of the south end of Elbow Lake the volcanic rocks (1) north of a mass of granitic rock form a sharp flexure. Lineations plunge steeply to the south; dips are from 75 to 90 degrees and the direction of dip is both north and south. This complicated structure probably represents a flexure formed during the intrusion of the granite. A similar structure occurs in Amisk rocks west of the north end of Elbow Lake.

In the west half of Elbow Lake map-area (north of Webb Lake) basic lavas (1) extend north into Batty Lake map-area as a part of the southeast limb of an anticline that trends northeast and plunges in the same direction (Robertson, 1950)[1]. The basic lava band in the northwest corner of Elbow Lake map-area possibly represents the nose of an anticline trending northeast and plunging in the same direction. Lack of top determinations and steep dips, however, makes it impossible to be certain of this interpretation. The structure south of Syme Lake probably also is anticlinal.

The Amisk rocks (1-3) in the east half of Elbow Lake map-area are tightly folded. Dips are steep and predominantly to the east. The axes of the folds trend east of north and plunge northerly.

Strata of the Kisseynew Complex (5-7), at the west end of Loonhead Lake, form the west part of a dome that trends about east and plunges about 15 degrees to the east. The eastern part of the dome was mapped by Harrison (Harrison, 1949). West and

---

[1] Names and dates in parentheses refer to references listed at end of report.

north of Loonhead Lake the Kisseynew rocks (5-7) lie in folds that trend about northeast and plunge in the same direction at about 25 degrees. Some of these folds probably are overturned to the northwest. Folds in the Kisseynew (5-7) and Amisk rocks (1-3) in the north part of Heming Lake map-area trend east and plunge east at about 30 degrees. These folds probably are overturned to the south similar to those of Sherridon map-area adjoining on the north (Bateman and Harrison, 1946).

FAULTS

Faults are numerous in areas underlain by volcanic (1) and sedimentary (2) rocks but also occur in the granitic rocks (10-13). Three directions of faulting are recognized; namely, east of north, west of north, and easterly.

Faults striking east of north and west of north probably are of the same age and origin. Where two such faults join one is not displaced by the other. The faults striking east occur mainly along the contact of the Kisseynew and Amisk strata and probably are older than the northerly trending faults.

Evidence of direction and the amount of displacement are difficult to obtain as most faults parallel the strike of the formations. Displacement of meta-pyroxenite contacts south of Loonhead Lake and the orientation of drag-folds, slickensides, and lineations in the shear zones, however, indicate that many of the faults trending east of north and west of north have right hand displacement. Minor structures on islands in Elbow Lake give conflicting evidence and suggest movement (chiefly horizontal) both to the north and south. The northeast trending faults in the basic lavas at the south border of Heming Lake map-area have left hand displacement; these faults abut against the pink biotite granites (13) and may be related to its intrusion.

All faults are marked by zones of intense shearing. Commonly, in volcanic rocks chlorite and epidote are developed whereas in biotite gneiss and granite white mica occurs in the sheared rocks. Crenulation and drag-folding of the shear planes are common. Mylonites occur along the fault near the entrance of Grass River into Elbow Lake. Crushed quartz and feldspar occur along fault zones in granite and to a lesser extent in volcanic rocks.

East trending faults are present at points along the contact of Kisseynew and Amisk strata in the north part of the map-areas. In the north part of Heming Lake map-area east trending faults occur both in the Kisseynew (5-7) and Amisk (1-3) rocks. One of these faults to the west is designated the Weldon Bay fault by Kalliokoski (Kalliokoski, 1949). Minor structures such as striations on mineral grains, crenulations, and drag-folds of shear planes indicate thrusting from north to south. The rocks, particularly the biotite gneisses, are highly sheared. In the vicinity of Loonhead Lake the contact of Kisseynew (5-7) and Amisk (1-3) rocks probably is a fault. Here evidence of movement is conflicting; minor structures indicate both thrusting from the south and horizontal movement.

MINERAL DEPOSITS

GENERAL STATEMENT

Two general types of mineral deposits are known in the map-areas. One is quartz veins containing minor amounts of sulphides and gold; the other is sulphide deposits with small amounts of quartz and carrying minor gold and, in some deposits, copper and zinc. Some sulphide deposits are reported to carry nickel.

Quartz veins are present throughout the basic volcanic rocks (1) but are most abundant near Elbow and North Star Lakes.

Quartz veins occur in shear zones and many such are parallel with the schistosity, although a few cross the strike of the enclosing volcanic formation. Many of the shear zones are exposed only from 300 to 500 feet along their strike, whereas others are exposed at intervals for several thousand feet. The shear zones parallel and lie close to large faults, hence are most abundant in volcanic rocks that are highly faulted, as those around Elbow Lake. The rocks in the shear zones are commonly altered to chlorite or chlorite-carbonate schist.

Quartz occurs in lenses, pods, branching veins, or regular veins in the shear zones. The veins or vein complexes vary in width from a few inches to about 12 feet. Quartz veins vary in length up to about 1,000 feet but many are only 200 or 300 feet long. Quartz veins do not occupy the full length of most shear zones. Inclusions of country rock and locally a brownish carbonate, probably iron bearing, are present in some veins. The quartz is fine to medium grained and mile-white to greyish in colour. Sulphide - forms less than 5 per cent in quartz and in included country rock. Pyrite is the most common sulphide but chalcopyrite, sphalerite, galena, arsenopyrite, and pyrrhotite also are found. Visible gold occurs in fractures in quartz, with sulphides, and along contacts of quartz and country rock.

Many quartz veins occur in volcanic rocks (1) that are highly faulted. The deposits are commonly near small bodies of 'quartz-eye' granite (10) or dykes of quartz-feldspar porphyry (8). Such relations suggest that the effect of shearing on rocks of varying competency to some extent controls the localization of shear zones and their contained quartz veins.

Sulphide deposits occur in schistose basic lavas (1) and in sedimentary rocks (2). They are found around the north end of Elbow Lake, and around Loonhead, Webb, Fay, Syme, and Peterson Lakes. These deposits consist of sulphides occurring as disseminated grains and solid masses in schist. The sulphides replace the schist, the amount of sulphide in the schist varying considerably in individual deposits. These zones are up to 50 feet wide and may be several hundred feet long. Commonly masses of solid sulphide are found in the central parts of the deposits. Pyrrhotite or pyrite are the abundant sulphides. Some deposits contain essentially pyrite or pyrrhotite whereas others carry both sulphides. Chalcopyrite and sphalerite occur locally in these deposits

and more rarely are found in considerable quantities. Where observed by the author, chalcopyrite is localized in stringers, veinlets, or irregular patches in the other sulphides, usually in parts of the deposit consisting of pure sulphide. The amount of gold is usually low in these deposits; nickel is reported from some of them. Narrow quartz veins, stringers, or lenses appear locally in the sulphide masses. These veins carry disseminated sulphide and in a few cases gold.

The sulphide deposits occur in local shear zones in highly faulted rocks. Some are in volcanic rocks (1) near younger gabbroic rocks (9) but this relationship is not true for all deposits.

Most of the deposits in the area were described in detail by Stockwell (Stockwell, 1935). Only those that have received attention in recent years are mentioned in this report.

DESCRIPTION OF DEPOSITS

The Century Mine

The Century mine (previously known as Webb and Garbutt claims) (Stockwell, 1945, p. 29) is on a large island in the northern part of Elbow Lake. In the 1940s the shaft was enlarged and deepened to 500 feet; drifting and crosscutting were done along veins at 125 and 250 feet in depth and some gold was produced. Camp buildings, a small mill, and assay office were erected on the property. Operation ceased in 1947. In the spring of 1951, 5,675 feet of diamond drilling was completed in six holes to cut the deposits from 600 to 1,100 feet vertically below the surface.

The deposits occur in schistose basic lavas (1), some of which are pillow lavas. The lavas are invaded by small bodies and dykes of quartz feldspar porphyry (8) that are strongly sheared and mineralized. Several strike faults are located on the island. The schistosity in the vicinity of the veins strikes 15 degrees west of north and dips 80 degrees east. The outcrops of the veins are covered by a dump and buildings and were not observed, but according to Stockwell (1935, p. 29) occur as lenses and branching veins in lavas and sheared porphyry. Their position may be in part controlled by a dyke of porphyry (8). Quartz is the abundant mineral in the veins along with carbonate and altered wall-rock inclusions. Pyrite and minor chalcopyrite occur in the veins and the wall-rocks. Visible gold was observed by the author in quartz, commonly at contacts of altered wall-rock and quartz. Stockwell reports the vein complex as up to 10 feet wide and exposed at intervals for several hundred feet along the strike.

A second deposit (Bow vein, Stockwell, 1935) 700 feet northwest of the zone described above has been explored by surface trenches and diamond drill-holes.

Vanderberg Group

The Vanderberg group of claims is on the west side of Elbow Lake near the north end. They were formerly known as the Apex Nos. 1, 2, and 3 and Bell claims. In recent years a few diamond drill-holes have been completed, most of them for assessment work. The main showings are on the Apex No. 1 and Bell claims.

The rocks exposed on the property are chiefly basic lava flows (1) with small bodies of meta-diorite. In the northern part of the group rhyolite (1) is abundant. These rocks are intruded by small bodies of 'quartz-eye' granite (10). Dykes of acidic porphyry (8) cut the basic lavas and meta-diorite.

Regional schistosity strikes about east and dips steeply both to the north and south. The rocks are cut by north trending faults and near these local shear zones are present. Chlorite schist is developed in all the shear zones and then strikes about north and dips steeply.

The deposits occur as quartz veins in shear zones. Quartz forms veins, stringers, and lenses. The zones of mixed quartz and schist vary in width from a few inches up to 15 feet. The exposed length of the vein complex is about 200 feet on the old Bell claim and about 175 feet on the Apex No. 1 claim. The quartz is fine to medium grained, and white to bluish grey in colour. A brown iron carbonate and, locally, feldspar occur in the quartz. Pyrite is present in the wall-rocks and in the quartz vein. In quartz, pyrite commonly occurs along grain boundaries, in small fractures, or at the contact of quartz and inclusions of country rock, and forms less than 5 per cent of the vein material. Minor amounts of chalcopyrite are erratically distributed in the vein, commonly in or near pyrite grains. Stockwell reports a channel sample taken across the vein and schist for a total length of 14 feet assayed 0.24 ounce of gold a ton and an assay of a chip sample of 0.40 ounce gold a ton (Stockwell, 1945, pages 17 and 18). The gold seems to be spottily distributed in the veins.

Elbow Lake Property

The Elbow Lake property is on the west shore of Elbow Lake south of Webb Creek. Stockwell refers to the property as the Gunwar group (Stockwell, 1945, p.20). In recent years the deposits have been diamond drilled and some surface work has been done.

The outcrops in the area are chiefly of basic volcanic rocks with minor amounts of rhyolite (1). These rocks are invaded by meta-diorite and cut by dykes of rhyolite and quartz-feldspar porphyry (8), many of which trend about northeast. Large bodies of hornblende-biotite quartz diorite (11) intrude members of (1) and (8).

Schistosity in the lavas trends nearly northeast and dips between 60 and 70 degrees southeast. The lavas are cut by shear zones, some of which strike about north and others nearly east. The east-striking shear zones tend to parallel dykes of acidic rock.

The quartz occurs in the local shear zones as veins, branching veins, and discontinuous lenses. The most important veins trend easterly. Two such veins have been explored by many trenches and two shallow shafts.

The easterly of these veins is from 1 foot to 3 feet wide and 200 and possibly 300 feet long. Locally, it is up to 5 feet wide. The second vein or zone of quartz lenses and sheared rock is several hundred feet west and here individual lenses of quartz are 3 feet wide with local widths of 5 feet. This zone is from 200 to 300 feet long.

The quartz in the veins is medium grained, white to grey, and forms over 95 per cent of the vein material. Brown carbonate and, locally, feldspar occur with the quartz. The quartz and sheared wall-rock contain pyrite. Chalcopyrite and sphalerite occur in the quartz. The veins locally carry coarse gold but no information is available concerning their average gold content. In the past, some gold was produced in small operations.

Ding How Property

The Ding How property is on a small island in the southeast part of Elbow Lake. In the past, a shaft was sunk on a quartz vein to a reported depth of 40 feet.

Rocks on the island are chloritic schists (1). Locally, cleavage planes are crinkled and drag-folded. The strike of the schistosity is north 30 degrees east and the dip close to vertical.

The outcrops of the deposit are covered by a dump and the shaft is full of water. Stockwell (1935, p. 36) reports two quartz veins in a shear zone trending north 30 degrees east. One extends 90 feet northeast of the shaft and to the northeast approximately along its strike, the second vein is about 15 feet long. The veins are up to 2 1/2 feet wide, but both narrow, widen, and branch. In the shaft, two veins, 1 foot and 1.5 feet wide, are exposed. The veins are reported to continue to the bottom of the shaft. Sheared country rock near and in the veins carries pyrite.

Examination of material on the dump and from exposed veins shows that the fine- to medium-grained, white to grey quartz is the essential gangue mineral. Locally, a brown carbonate is present. The quartz contains about 1 per cent pyrite and minor chalcopyrite and sphalerite. Gold was observed in several specimens. It commonly occurs in quartz near small altered inclusions of country rock.

Webb Property

The Webb property is on the west shore of a small lake southwest of Webb Lake. The rocks in the vicinity are highly altered lavas (1) in the contact zone of a large body of granitic rock (11) lying to the west. The lava is highly sheared along a north trending fault.

The showing is a sulphide deposit and consists of a zone of lava (1) partly replaced by sulphide. The zone is about 30 feet wide and is exposed 100 to 200 feet along the strike. Locally, the replacement is almost complete, resulting in small bodies of massive sulphide. Small quartz veins or lenses are scattered throughout the sulphide zone. Both fine-grained pyrite and pyrrhotite occur but pyrite is the more abundant. Minor amounts of chalcopyrite were observed and one vein 1 inch wide of almost pure chalcopyrite is exposed in one trench. The average gold and copper content is reported to be low.

Parres Property

The Parres property is a gold prospect at the northeast end of a small lake in the northwest corner of Elbow Lake map-area. Part of the showing is on a small island in the lake and this was not examined. The property was staked in 1950 and trenching, stripping, and diamond drilling have since been completed. Information on the deposit is incomplete.

The rocks in the vicinity of the deposit are metamorphosed lavas (1) locally converted to banded gneisses (1b). Narrow layers of sediment are interbanded with the lavas. These rocks are cut by a body of hornblende-biotite quartz diorite (11). The foliation of the lavas strikes north to west of north and dips steeply. Small shear zones cut the basic lavas, and quartz veins and lenses in one of these are reported by the owners to carry gold.

Kay Lake Property

Kay Lake property is at the south end of a small lake south of Peterson Lake near the south boundary of Heming Lake map-area. During the period 1950-52 the deposit was explored by sixteen regularly spaced trenches and diamond drill-holes.

The rocks in the vicinity of the prospect are altered basic lavas (1) cut by syenodiorite (12) and pink biotite granodiorite (13). The lavas are faulted and sheared. Chloritic schists are developed in the shear zones. The schistosity, faults, and shear zones strike northeast and dip nearly vertically.

The deposit consists of two quartz veins in a shear zone, exposed for a length of about 1,300 feet. In detail, one vein is exposed at intervals along the full length of the zone and the second, about 3 feet north of it, is exposed along a part of the length. The whole zone varies in width from about 3 feet to a maximum of 15 feet.

Quartz is medium to fine grained and varies in colour from milk-white to a bluish grey. Sulphides are most abundant in the bluish grey quartz. The quartz has been fractured and breaks as rough rhombs. Sulphides include pyrite, chalcopyrite, and galena and occur in fractures and seams in the quartz. Pyrite is present in the schists adjoining the veins. Most of the galena is in a length of 300 feet of vein south of a point about 300 feet from the

northeast end of the deposit. Sulphides are estimated to form about 1 per cent of the vein material. No information concerning the average gold content of the deposit is available to the author.

Vamp Lake Property

The Vamp Lake property is on the large island in the north part of Vamp Lake and is held by Lee Gordon Mines Limited. This company has carried out surface exploration and magnetometer and electromagnetic surveys, and completed some diamond drilling with X-ray and heavy drills.

The rocks in the vicinity of the deposit consist of basic lavas (1) with some rhyolite (1) that may be either intrusive or extrusive. A small mass of gneissic granite (11) occurs in the western part of the island. The basic volcanic rocks are altered hornblende gneiss (1b) and the foliation strikes north about 35 degrees east and dips vertically or steeply to the east.

The gneisses are cut by a fault paralleling the foliation and the formation on the east side of the fault probably moved north with respect to that on the western side. The amount of the displacement is unknown. The fault probably is an extension northward of the fault on the mainland to the south.

Much of the basic rock of the island contains pyrite, at spots up to 3 per cent. The main sulphide bodies, however, occur as lenses in the fault zone. These consist of fine- to medium-grained pyrite with some pyrrhotite, chalcopyrite, and minor sphalerite. The company reports copper, zinc, and gold in the deposit.

Some work has been done on a prospect on the mainland southwest along the projected strike of the main showing. Here a similar deposit to that on the island is exposed but details concerning its size and average grade are not available. Some copper and zinc are reported.

Redwin Property

The Redwin property is on Fay Lake in the northern part of Heming Lake map-area. In the past, surface work, diamond drilling, and an electromagnetic survey were completed.

Bedrock consists of metamorphosed basic lavas (1) intruded by rhyolite and feldspar porphyry (8), and both groups by hornblende-biotite quartz diorite (11) a short distance south of the deposit. The foliation trends east and dips from 60 to 80 degrees north. The lavas are cut by shear zones probably contemporaneous with major east trending faults passing a short distance north of the deposit.

The deposits consist of sulphide bodies and quartz veins and occur in the shear zones. The schist is partly replaced by sulphides and locally the replacement is complete, resulting in lens-shaped bodies of massive pyrrhotite and pyrite. The quartz occurs

in narrow veins, lenses, and pods in the sheared, sulphide-bearing rock. Pyrite and pyrrhotite are present in varying proportions. In general, however, pyrite is more abundant than pyrrhotite in partly replaced rock, but in massive bodies pyrrhotite is abundant. Minor amounts of chalcopyrite occur in quartz veins and in the sulphide-rich zones. Some gold is reported and the quartz veins apparently contain most of the gold. The average copper content and the distribution of the copper in the deposit were not determined.

Sulphide and quartz bodies are known to extend 600 feet along the strike. In this length, however, the quartz and sulphide bodies are separated by about 200 feet wherein outcrops are small. The strike of the foliation suggests that the two main outcrops represent separate bodies, each about 200 feet long. The sulphide deposits are up to 20 feet wide and the quartz veins within the sulphide zones are up to about 1 foot wide and most are less than 50 feet long.

Fay Lake Property

The Fay Lake property is between Fay Lake and the railroad just north of Mile 29. Surface work has been done on the showing and in September 1952 geophysical work was in progress.

The deposit is in hornblende-plagioclase gneiss (1b) intruded by bodies of rhyolite porphyry (8). The foliation strikes about east and dips steeply to the north. Lineation plunges east at about 30 degrees. The gneiss is sheared locally and such zones probably are related in origin to some of the major faults nearby.

Quartz occurs in shear zones as veins, lenses, and pods. In one trench, two veins are separated by about 10 feet of altered and sheared gneiss; in a second, about 75 feet along the strike, only one vein is present. The veins are 2 feet wide at points and their known length is about 100 feet. The quartz is fine to medium grained and white to grey in colour; at places it contains up to 3 per cent combined pyrite, arsenopyrite, galena, and chalcopyrite. The wall-rock carries pyrite and arsenopyrite, and gold; grab samples are reported by the owners to assay 0.23 ounce gold a ton.

Other Deposits

In the interval 1915 to 1950 certain parts of the map-areas were prospected and the mineral discoveries were explored. Many of the pits and trenches then made are caved or the sulphides oxidized so that little information about these deposits can be obtained from a study of their present outcrops. Details of many of these discoveries are published in reports of the Geological Survey of Canada during this period: Bruce, Memoir 105, 1918; Armstrong, Summary Report, Part C, 1922; Wright, Summary Report, Part C, 1930; Stockwell, Memoir 208, 1935; and Harrison, Memoir 250, 1949.

REFERENCES

Bateman, J. D., and Harrison, J. M. (1946): Sherridon, Manitoba; Geol. Surv., Canada, Map 862A, with descriptive notes.

Harrison, J. M. (1949): Geology and Mineral Deposits of the File-Tramping Lakes Area, Manitoba; Geol. Surv., Canada, Mem. 250.

Kalliokoski, J. (1949): Weldon Bay Area, Manitoba; Geol. Surv., Canada, Paper 49-5.

Podolsky, T. (1951): Cranberry Portage (East half), Manitoba; Geol. Surv., Canada, Paper 51-7.

Robertson, D. S. (1950): Batty Lake, Manitoba; Geol. Surv., Canada, Map 1006A, with descriptive notes.

Stockwell, C. H. (1935): Gold Deposits of Elbow-Morton Area, Northern Manitoba; Geol. Surv., Canada, Mem. 208.

EDMOND CLOUTIER, C.M.G., O.A., D.S.P.
QUEEN'S PRINTER AND CONTROLLER OF STATIONERY
OTTAWA, 1955.